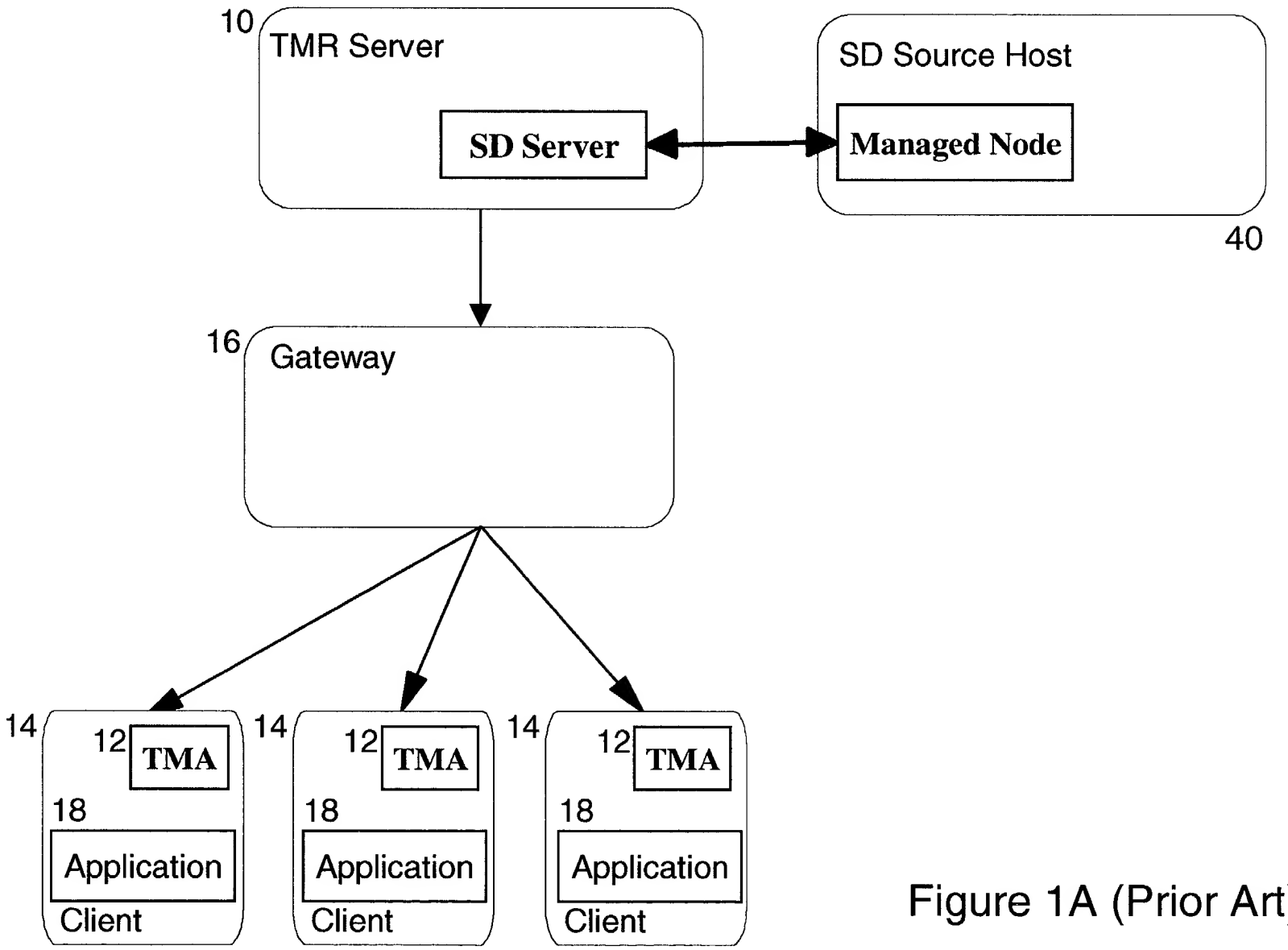


Figure 1A (Prior Art)

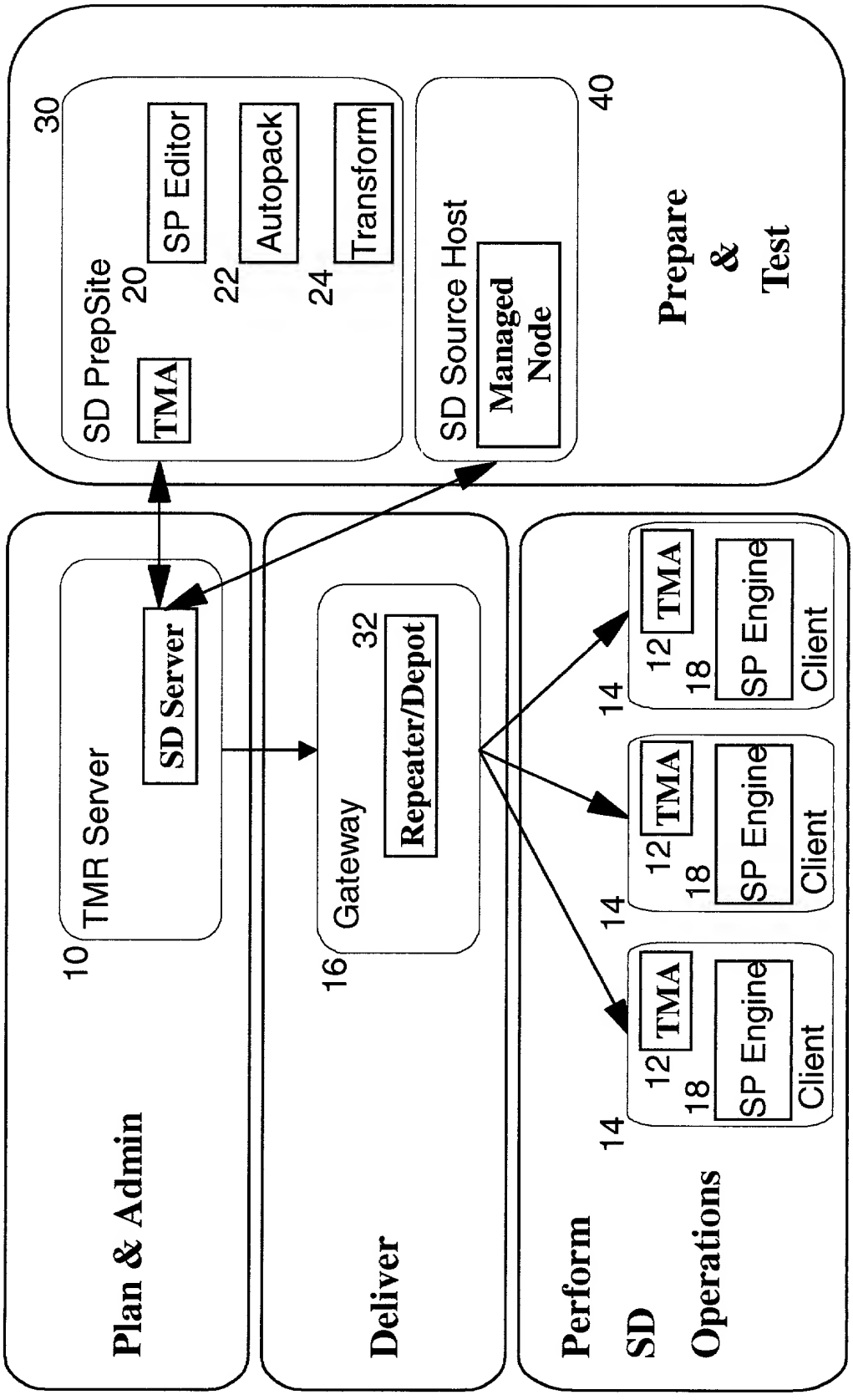

Plan & Admin
Deliver
Perform SD Operations
Prepare & Test
TMR Server
10
SD Server
Gateway
16
32
Repeater/Depot
SD PrepSite
30
20
TMA
SP Editor
22
Autopack
24
Transform
SD Source Host
40
Managed Node
12
TMA
14
18
SP Engine
Client

Figure 1B

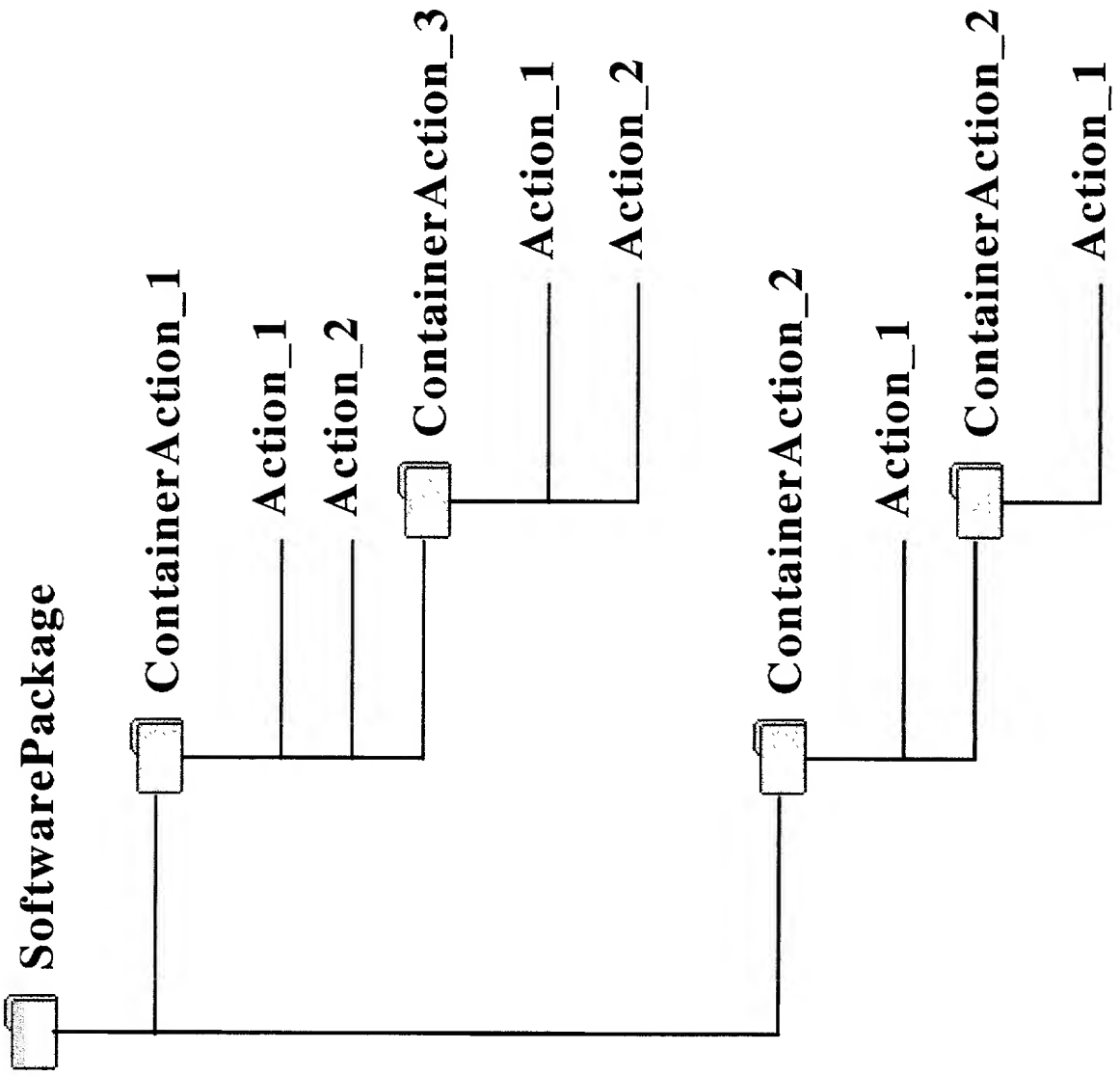

SoftwarePackage
ContainerAction_1
Action_1
Action_2
ContainerAction_3
Action_1
Action_2
ContainerAction_2
Action_1
ContainerAction_2
Action_1

Figure 2

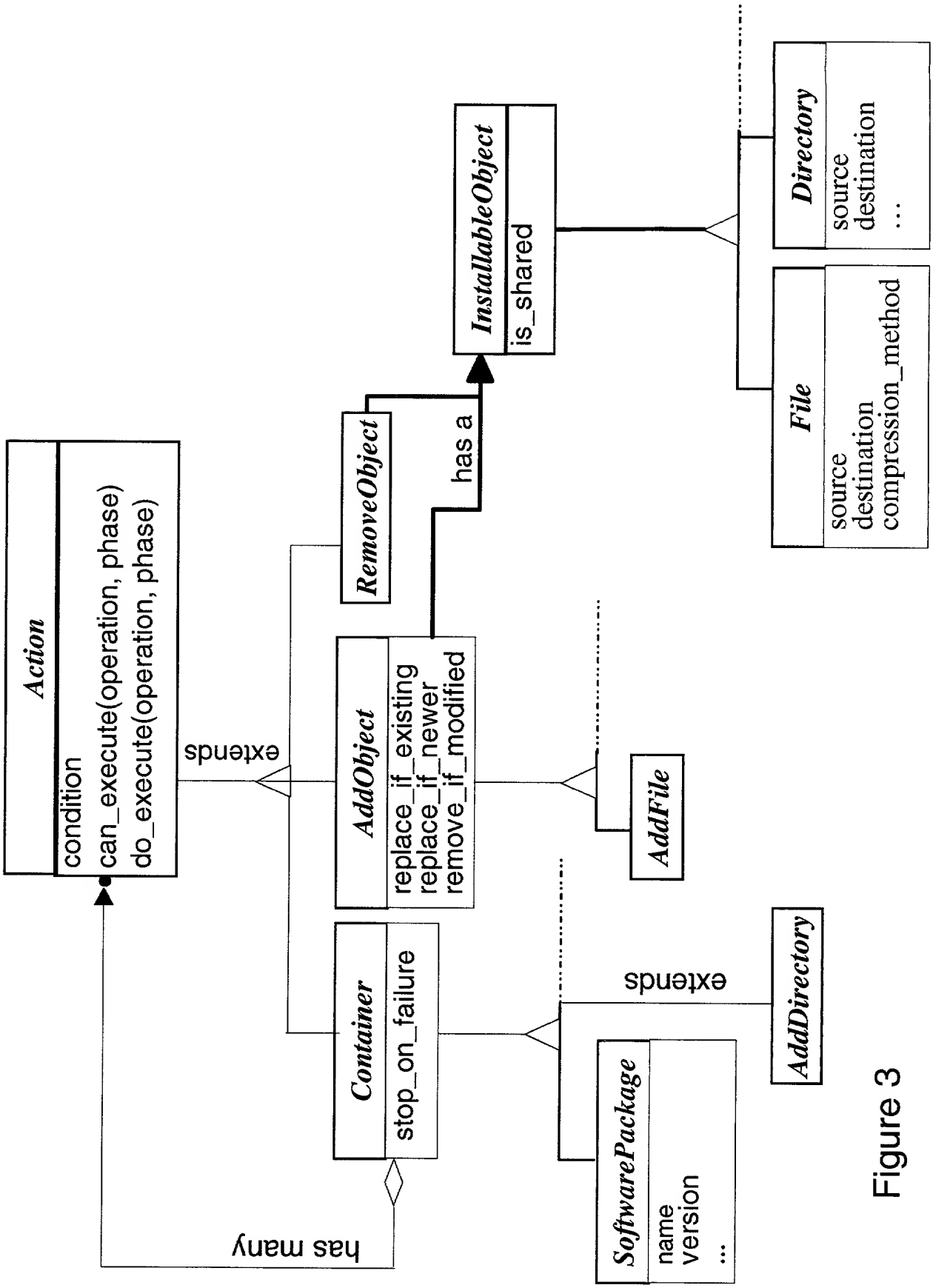

Action
condition
can_execute(operation, phase)
do_execute(operation, phase)
extends
AddObject
replace_if_existing
replace_if_newer
remove_if_modified
RemoveObject
has a
InstallableObject
is_shared
Directory
source
destination
...
File
source
destination
compression_method
AddFile
Container
stop_on_failure
has many
SoftwarePackage
name
version
...
extends
AddDirectory

Figure 3

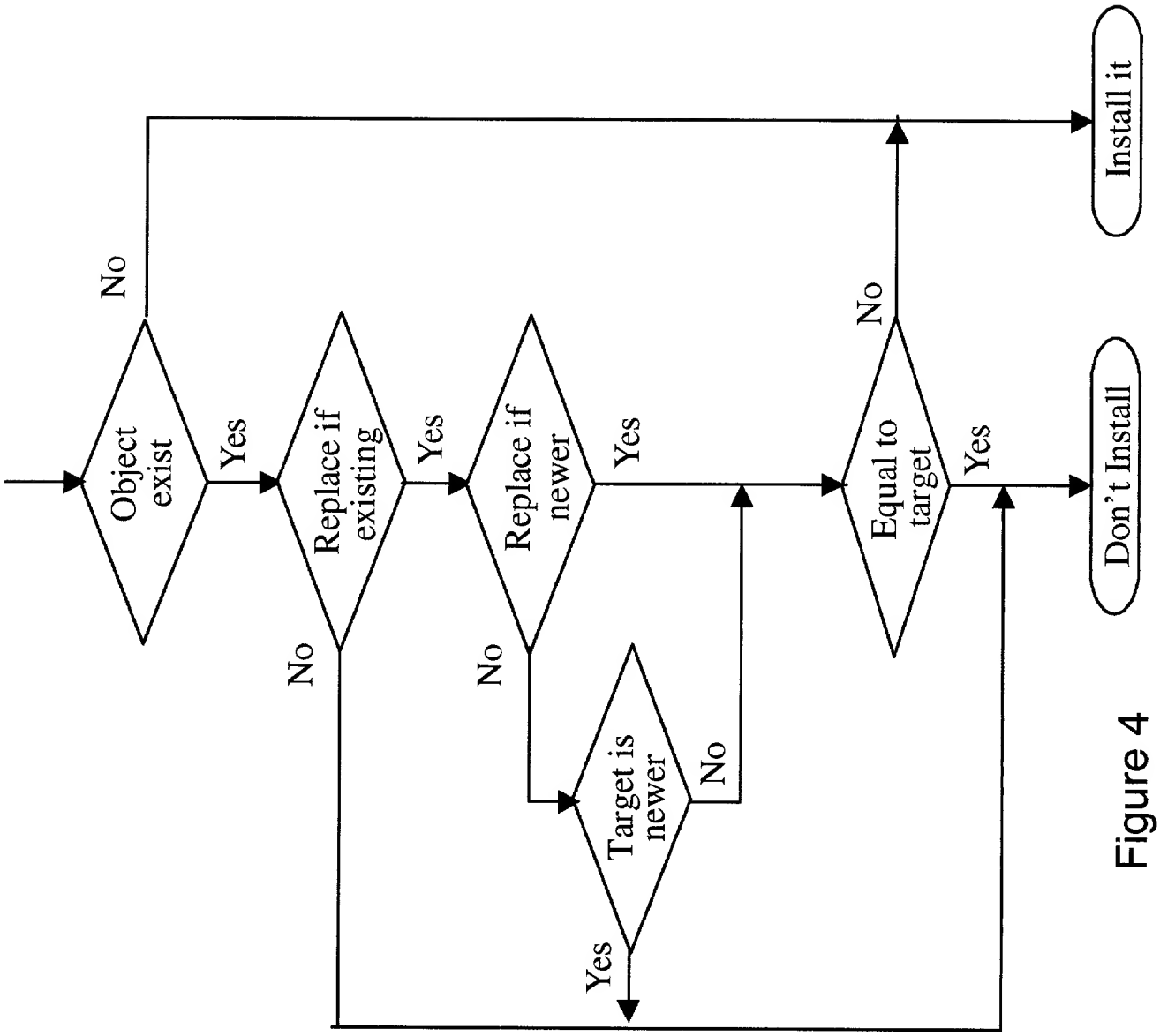

Object exist
Yes
No
Replace if existing
Yes
No
Replace if newer
Yes
No
Target is newer
Yes
No
Equal to target
Yes
No
Install it
Don't Install

Figure 4

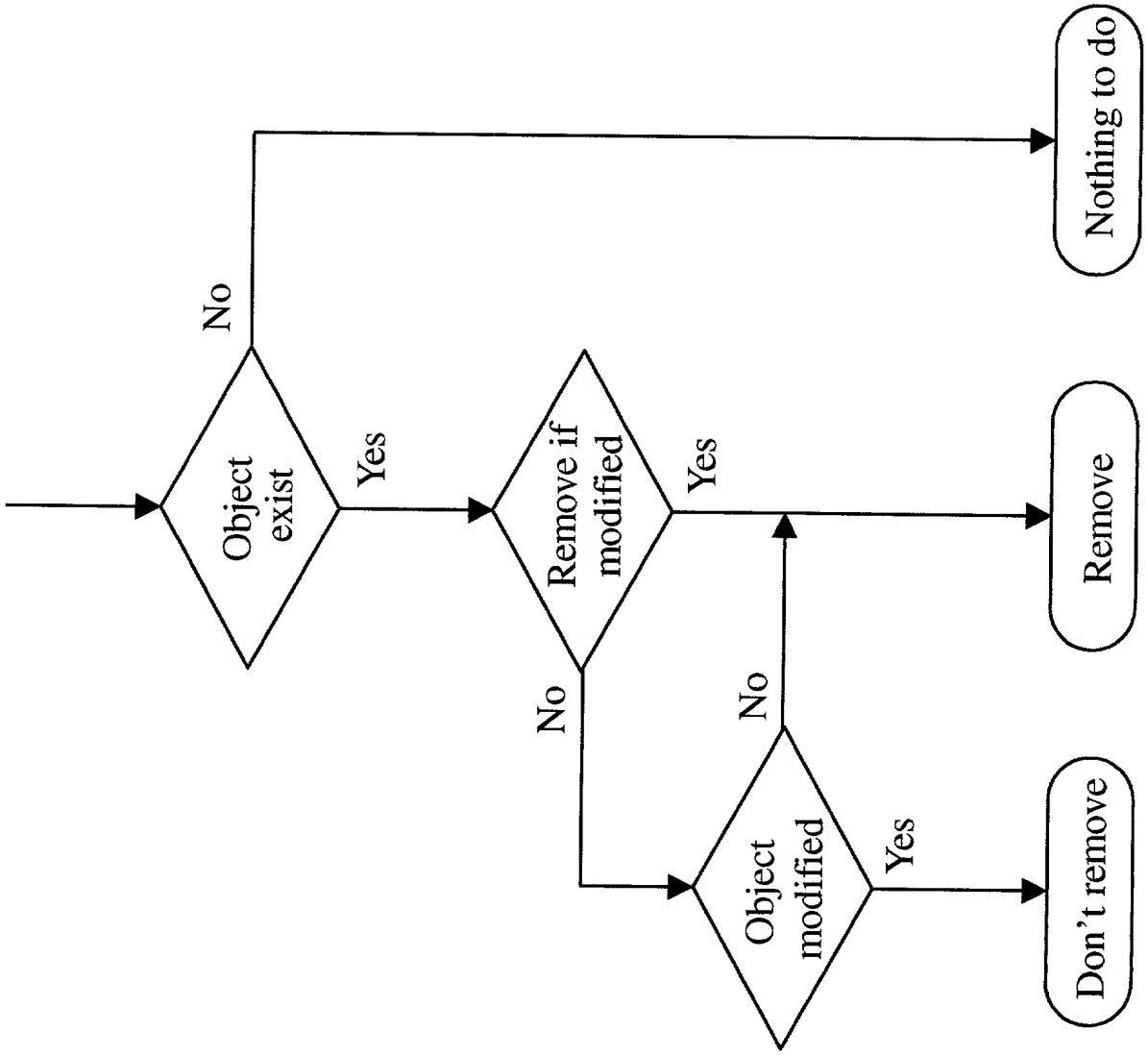

Object exist
No
Yes
Nothing to do
Remove if modified
Yes
Remove
No
Object modified
No
Yes
Don't remove

Figure 5

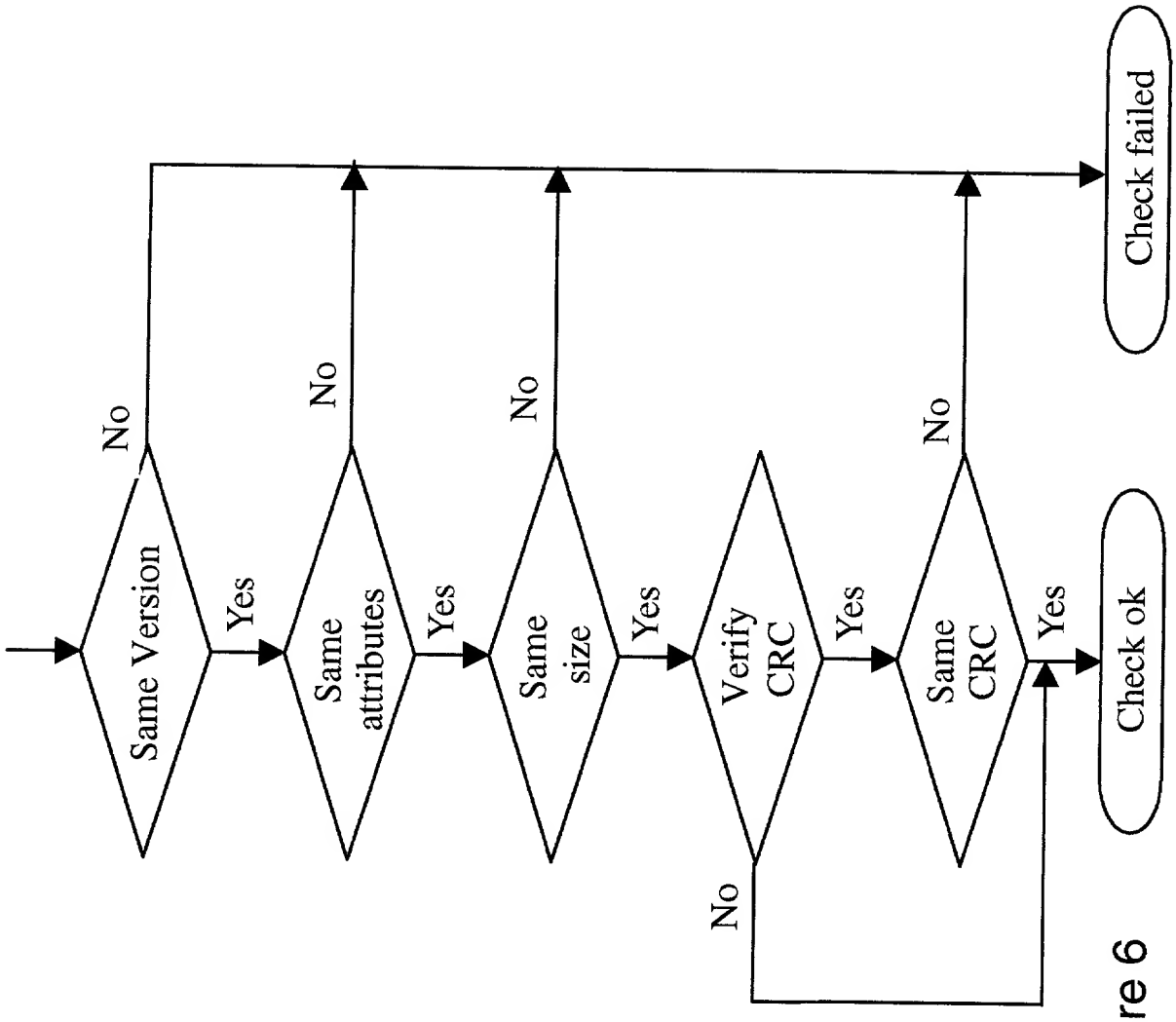

Same Version
Yes
No
Same attributes
Yes
No
Same size
Yes
No
Verify CRC
Yes
No
Same CRC
Yes
No
Check ok
Check failed

Figure 6

Object related actions	Registry Key and Value Shell Folder and Shortcut INI file Section and Item NT Service Profile Item Desktop Object, Folder, Program, Shadow Directory and File Text file line, command, token Symbolic link
System actions and Checks	Restart Check disk space
Program actions	Execute user program Execute MS Setup program Execute InstallShield program Execute CID Program

Figure 7

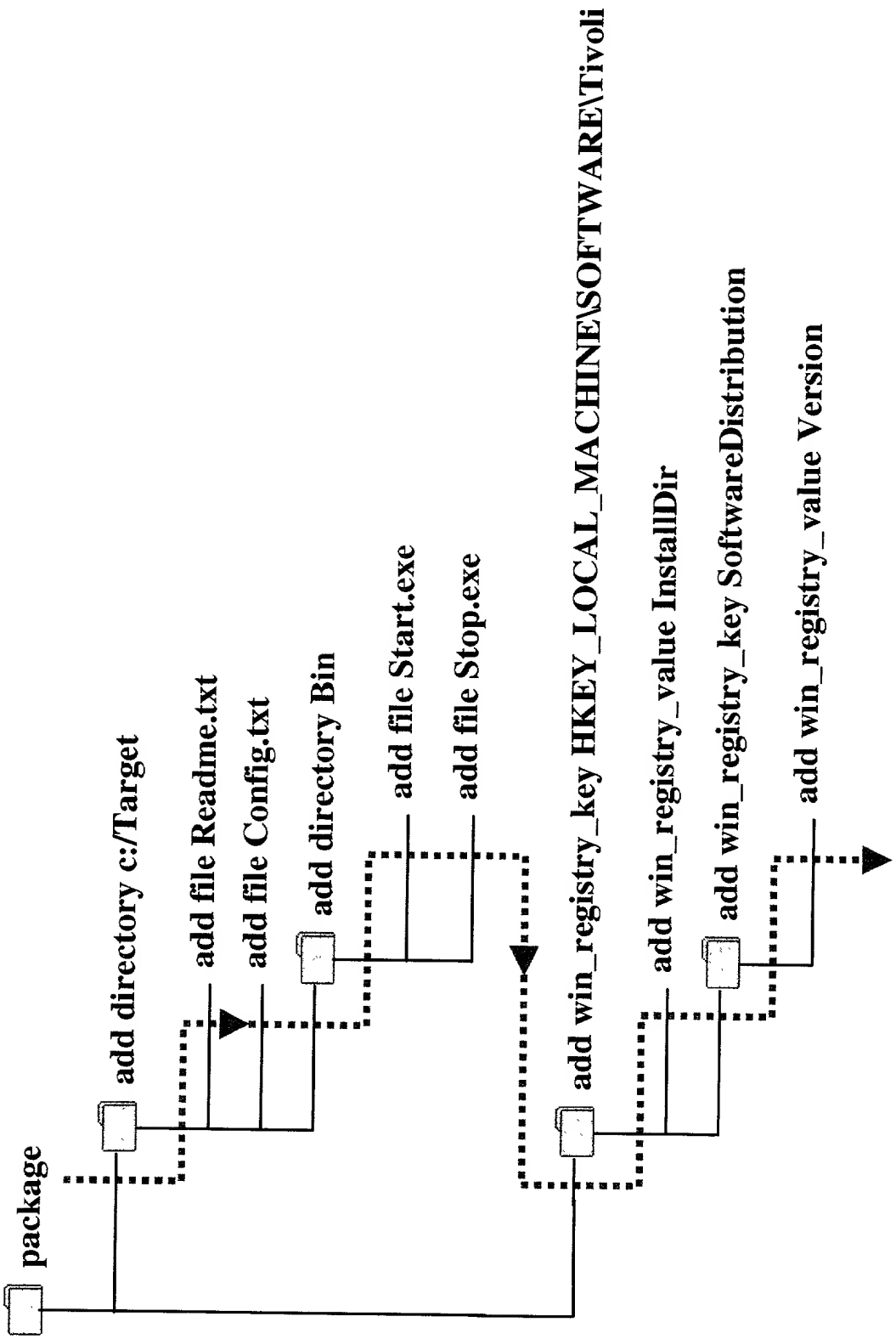

package
add directory c:/Target
add file Readme.txt
add file Config.txt
add directory Bin
add file Start.exe
add file Stop.exe
add win_registry_key HKEY_LOCAL_MACHINE\SOFTWARE\Tivoli
add win_registry_value InstallDir
add win_registry_key SoftwareDistribution
add win_registry_value Version

Figure 8

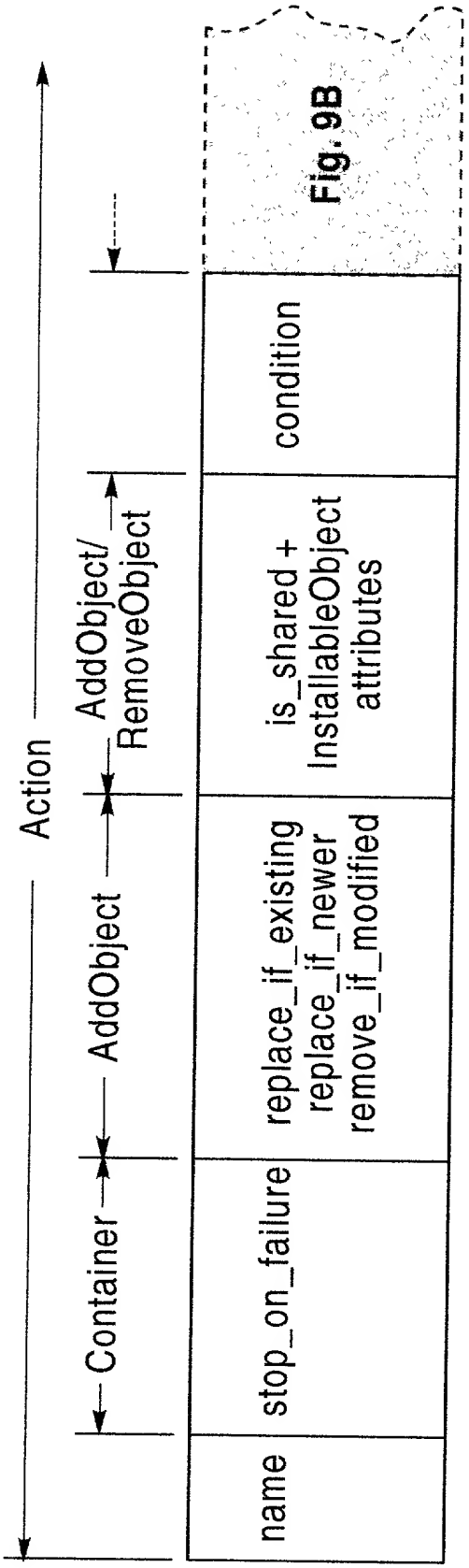


Figure 9A

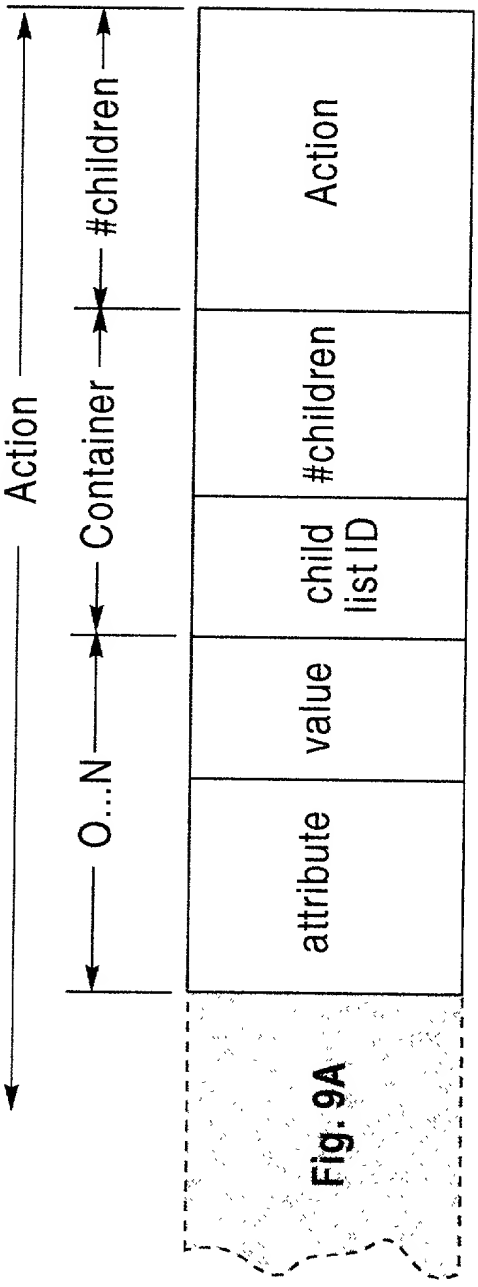


Figure 9B

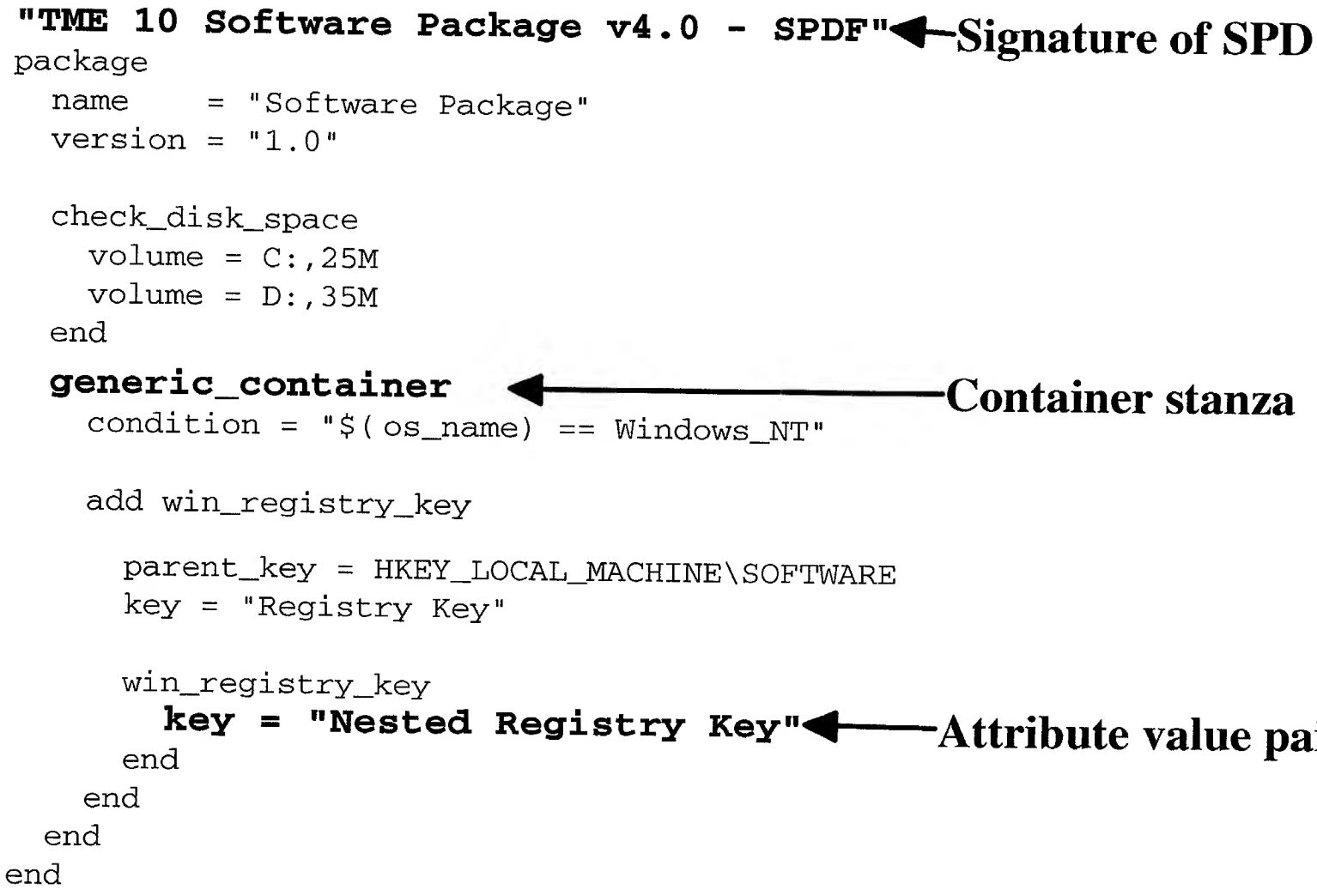

"TME 10 Software Package v4.0 - SPDF"
Signature of SPD
package
name = "Software Package"
version = "1.0"
check_disk_space
volume = C:,25M
volume = D:,35M
end
generic_container
Container stanza
condition = "$(os_name) == Windows_NT"
add win_registry_key
parent_key = HKEY_LOCAL_MACHINE\SOFTWARE
key = "Registry Key"
win_registry_key
key = "Nested Registry Key"
Attribute value pair
end
end
end
end

Figure 10

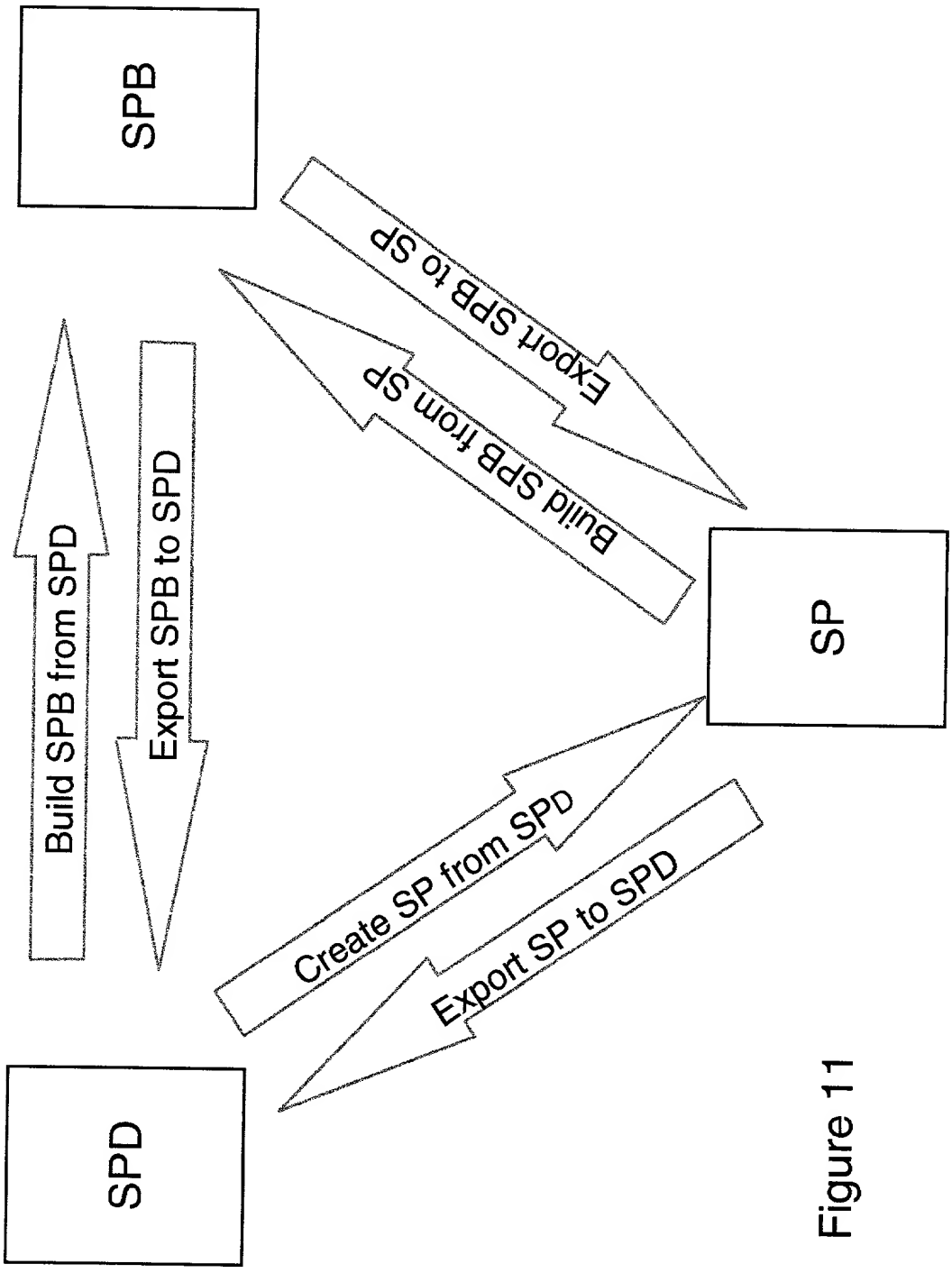

SPB
Export SPB to SP
Build SPB from SP
Build SPB from SPD
Export SPB to SPD
SP
Create SP from SPD
Export SP to SPD
SPD

Figure 11

```
...
add directory
  location       = c:/Winnt/System32/
  destination    = c:/Winnt/System32/

  file
    name         = MyApp.DLL
  end
end

add directory
  location       = c:/MyApp
  destination    = c:/MyApp
  descend_dirs = y
end
...
```

Figure 12A

```
...
add directory
  location       = c:/Winnt/System32/
  destination    = $(system_dir)

  file
    name         = MyApp.DLL
  end
end

add directory
  location       = c:/MyApp
  destination    = $(target_dir)
  descend_dirs = y
end
...
```

Figure 12B

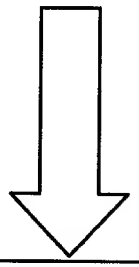
```
...
add directory
   condition = "$(os_name) LIKE 'Win*'"
   location      = c:/winnt/system32
   destination   = $(system_dir)
   file
     name = MyApp.DLL
   end
end
add directory
   condition = "$(os_name) == SunOS OR $(os_name) == AIX"
   location      = c:/unix/
   destination   = $(home_path)
   file
     name        = MyApp.a
   end
end
...
```

Figure 12C

```
...
add directory
  location      = c:/MyApp
  destination   = $(target_dir)
  file
    name = MyApp.CFG
    substitute_variables = y
  end
end
...
```

Figure 13A

```
 MyApp .CFG template file
+-----------------------+
hostname = $(hostname)
install_ dir  = $(target_ dir)
installed_OS = $(  os_name)
```



```
 MyApp .CFG configured file
+-------------------------+
hostname = mcrudele.   rome .tivoli.com
install_ dir  = c:\ MyApp
installed_OS = Windows_NT
```

Figure 13B

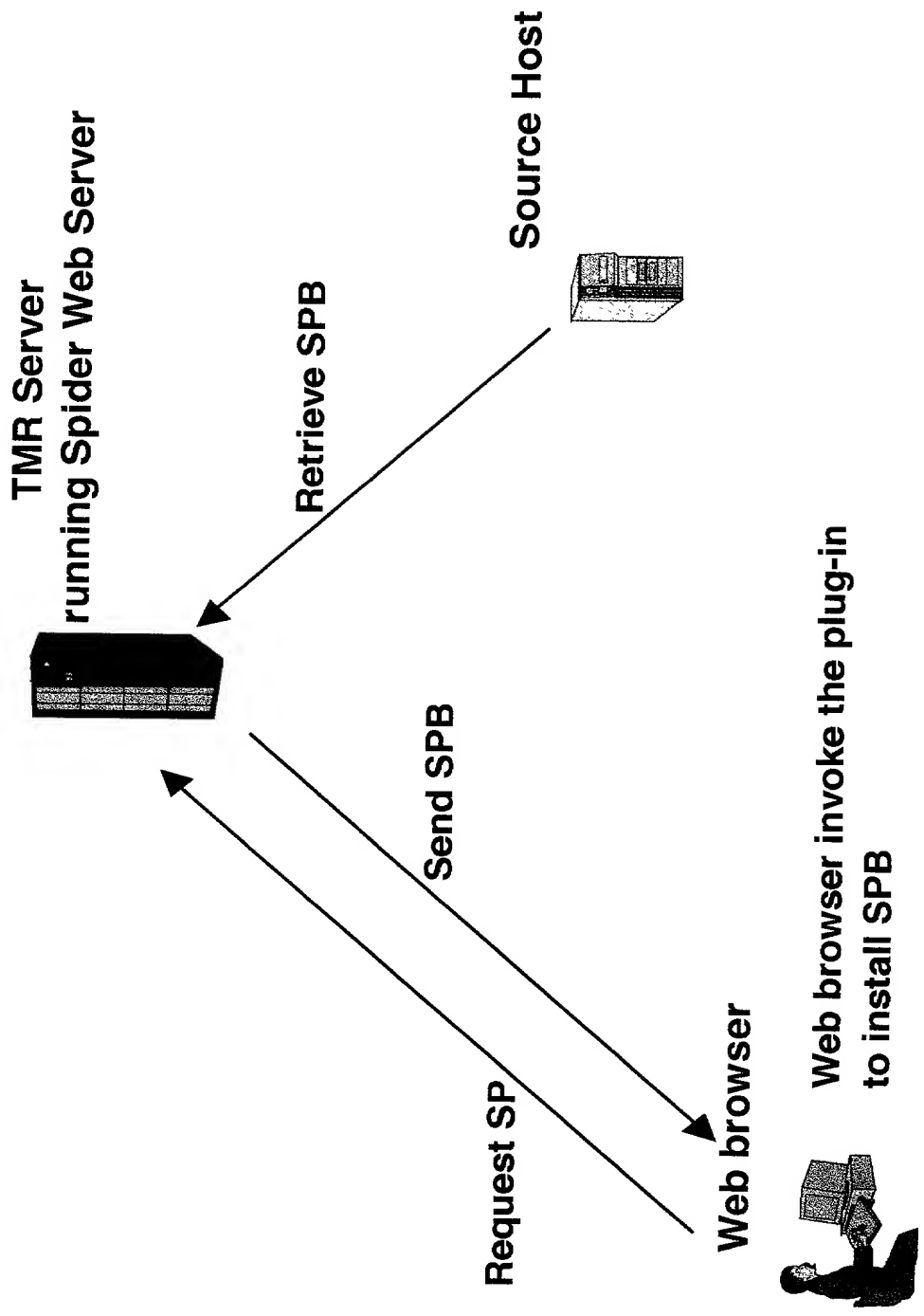

TMR Server
running Spider Web Server
Retrieve SPB
Source Host
Send SPB
Request SP
Web browser
Web browser invoke the plug-in
to install SPB

Figure 14

wdcrtsp	Create a SPB file from a SPD file
wdexptsp	Export a SPB file into SPD file
wdbldspb	Build a SPB file from a SP
autopack	Run AutoPack snapshots/differences
wdinstsp	Install a SPB
wdrmvsp	Remove a SP
wdcmmtsp	Commit a SP
wdundosp	Undo a SP Install/Remove
wdacptsp	Accept an undoable Install/Remove
wdversp	Verify the state of a SP

Figure 15

wimpspo	Associate a Software Package to a SPO
wconvspo	Convert the format of a SPO
wexpspo	Export a SPO into SPD file
wldsp	Loads SP on one or more Depots
wuldsp	UnLoad a SP from one or more Depots
winstsp	Install a SP
wremovsp	Remove a SP
wcommtsp	Commit a SP
wundosp	Undo a SP Install/Remove
waccptsp	Accept an undoable Install/Remove
wversp	Verify the state of a SP

Figure 16

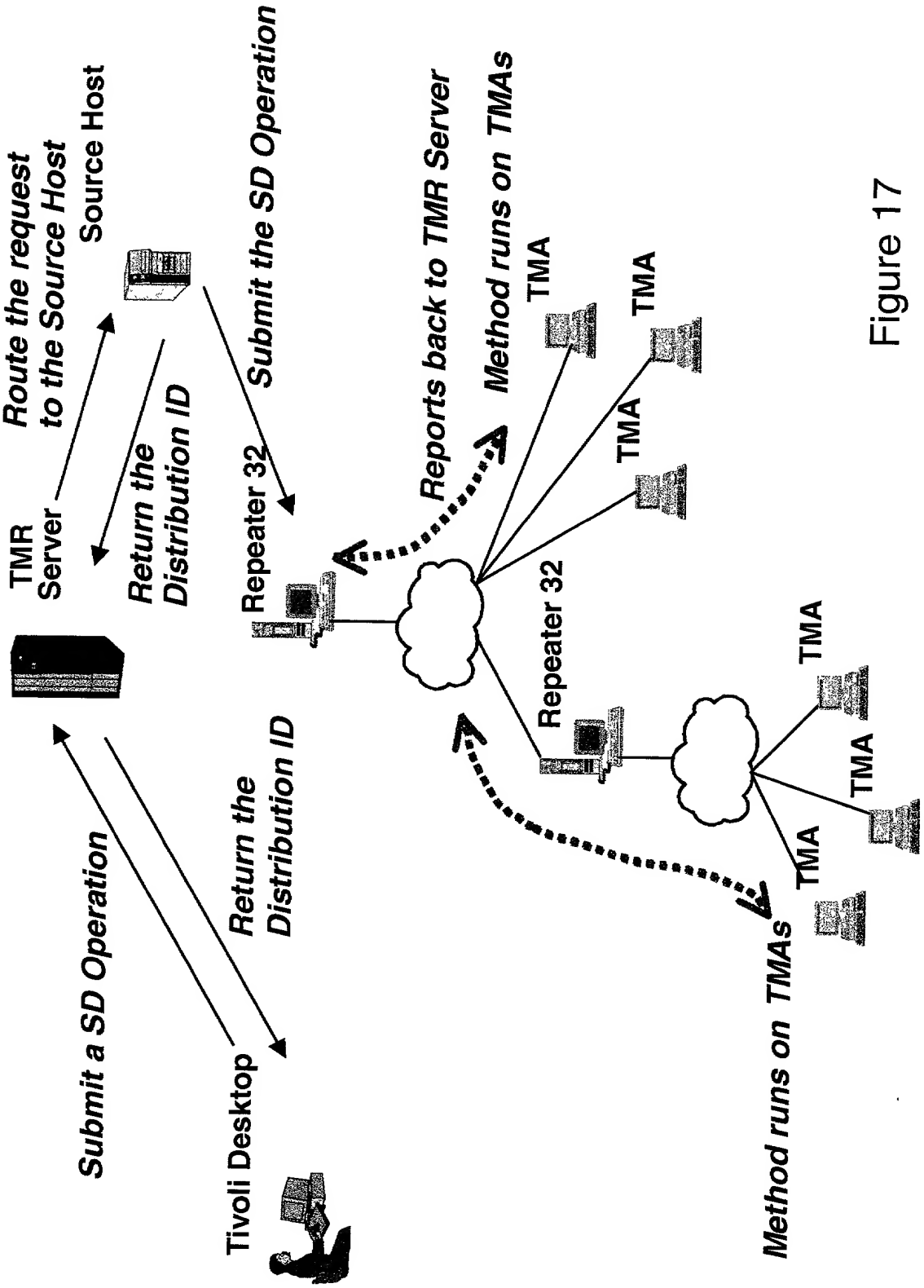

Route the request
to the Source Host
Source Host
TMR
Server
Return the
Distribution ID
Submit the SD Operation
Repeater 32
Reports back to TMR Server
Method runs on TMAs
TMA
TMA
TMA
Repeater 32
TMA
TMA
TMA
Method runs on TMAs
Submit a SD Operation
Return the
Distribution ID
Tivoli Desktop

Figure 17

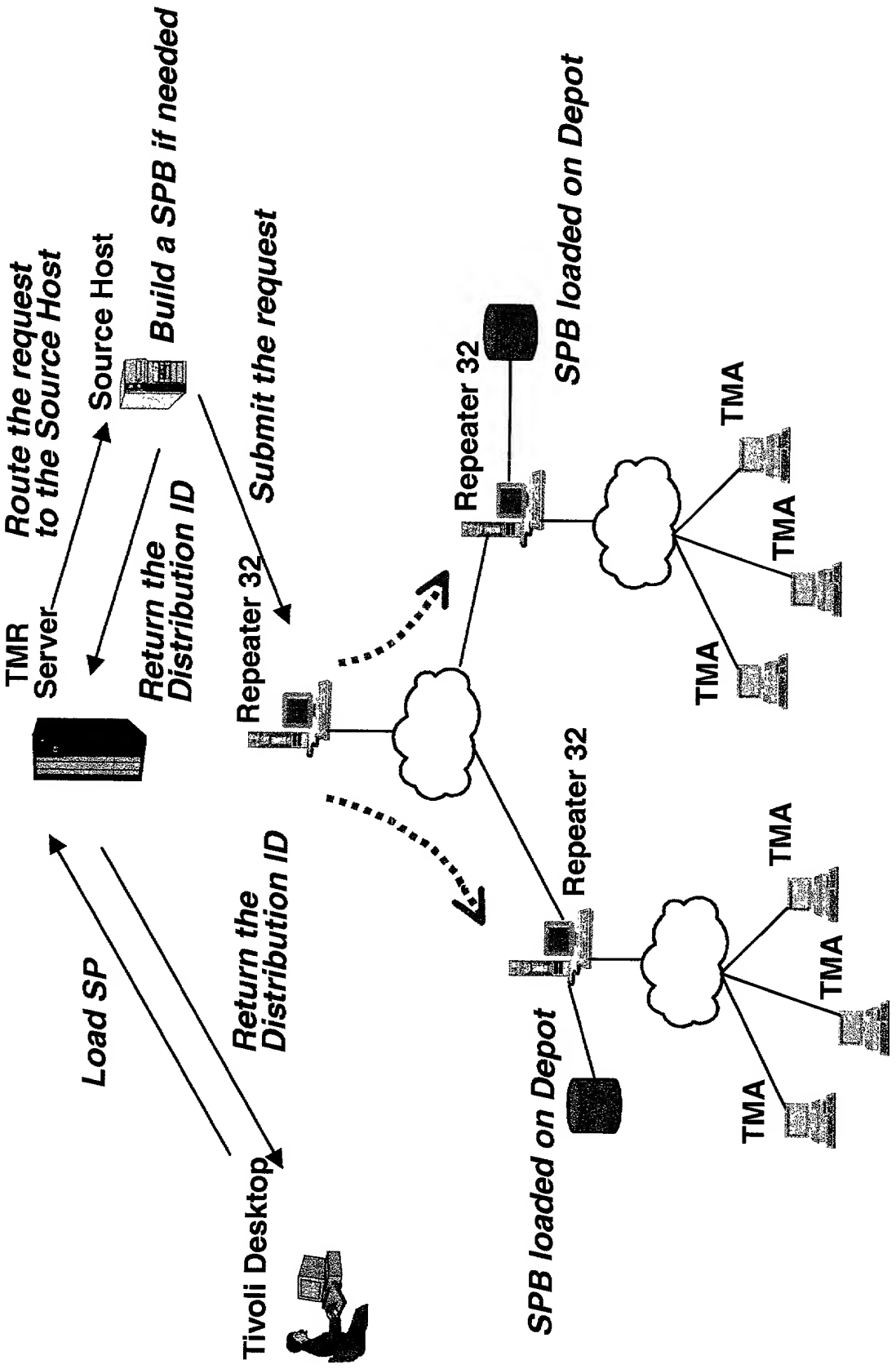

Route the request to the Source Host
Source Host
Build a SPB if needed
Submit the request
TMR Server
Return the Distribution ID
Repeater 32
SPB loaded on Depot
TMA
TMA
TMA
Repeater 32
Load SP
Return the Distribution ID
Repeater 32
TMA
TMA
TMA
Tivoli Desktop
SPB loaded on Depot

Figure 18

	Install	Remove	Accept	Undo	rollBack	Commit	Verify
transactional	X	X		X			
undoable	X	X					
undoable in transactional	X	X					
transactional & undoable	X	X					

Figure 19

Operation	**State**	**Undo state**	**Reboot state**	**Flag**
Install	**P**repared	**P**repared	Re**B**oot requested	**C**hanging
Remove	**C**ommitted	**U**ndoable	-	In **E**rror
		Restored		-
		-		

IC--- means that an Install has been committed
ICU-- means that an Install has been committed and can be undone
IP-BC means that an Install has been prepared and it will be committed during the next reboot
RCU-- means that a Remove has been committed but it can be undone
IC--E means that an Install has been committed but the SP is in error, so the application may not work properly

Figure 20

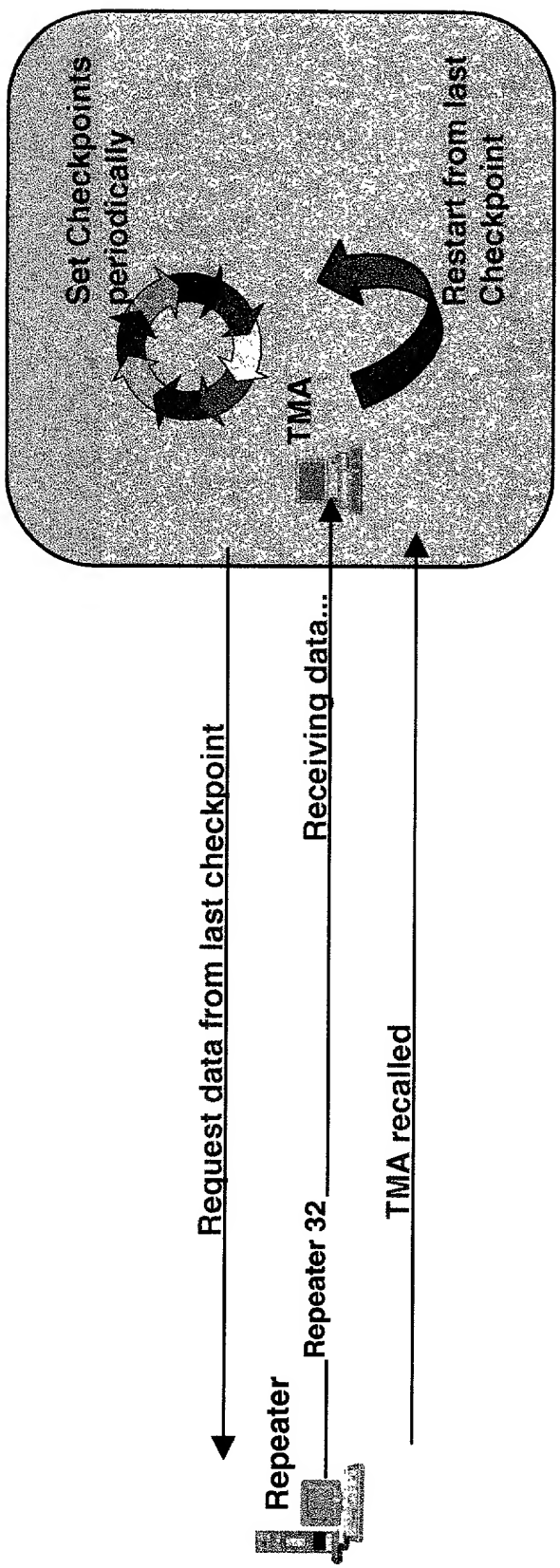


Figure 21

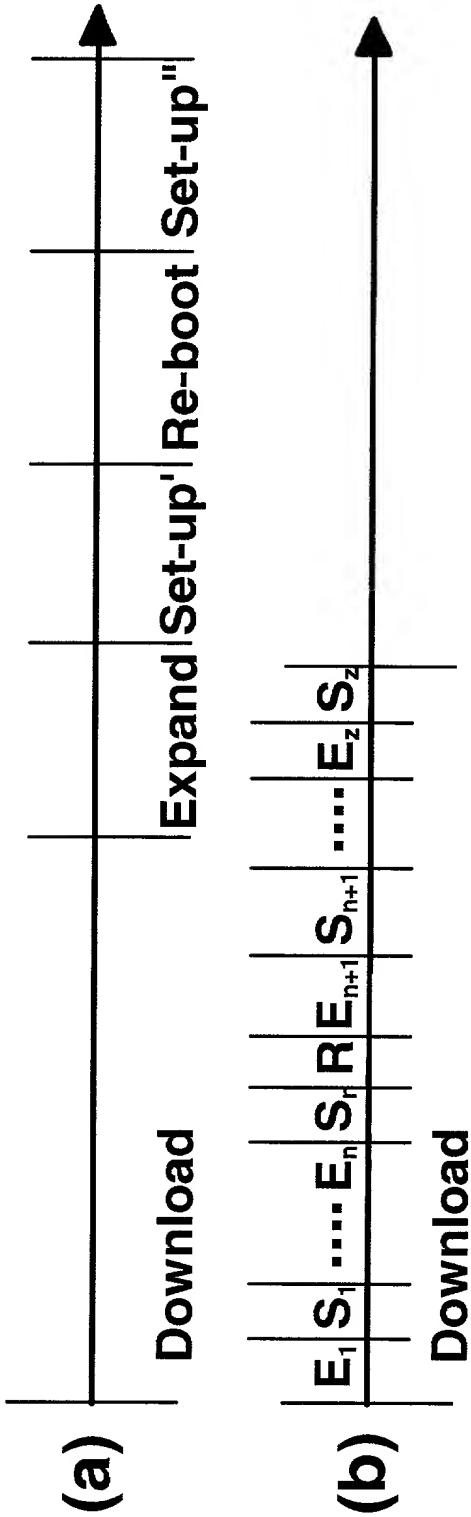


Figure 22

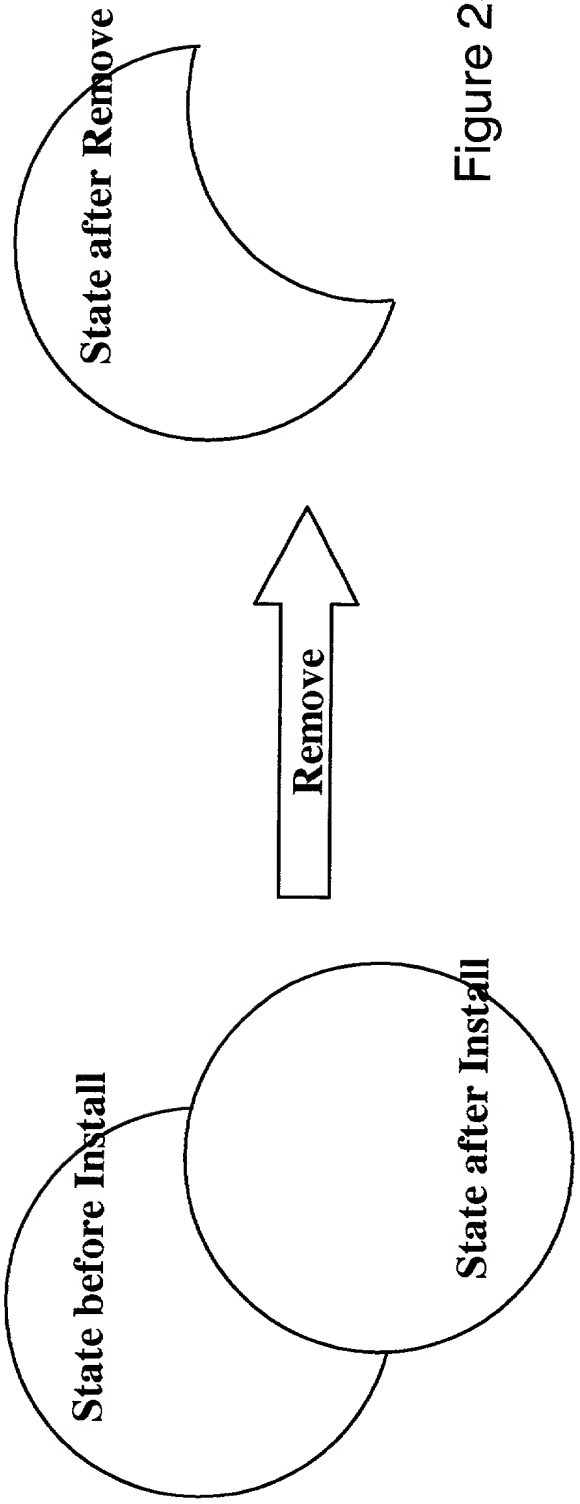


Figure 23

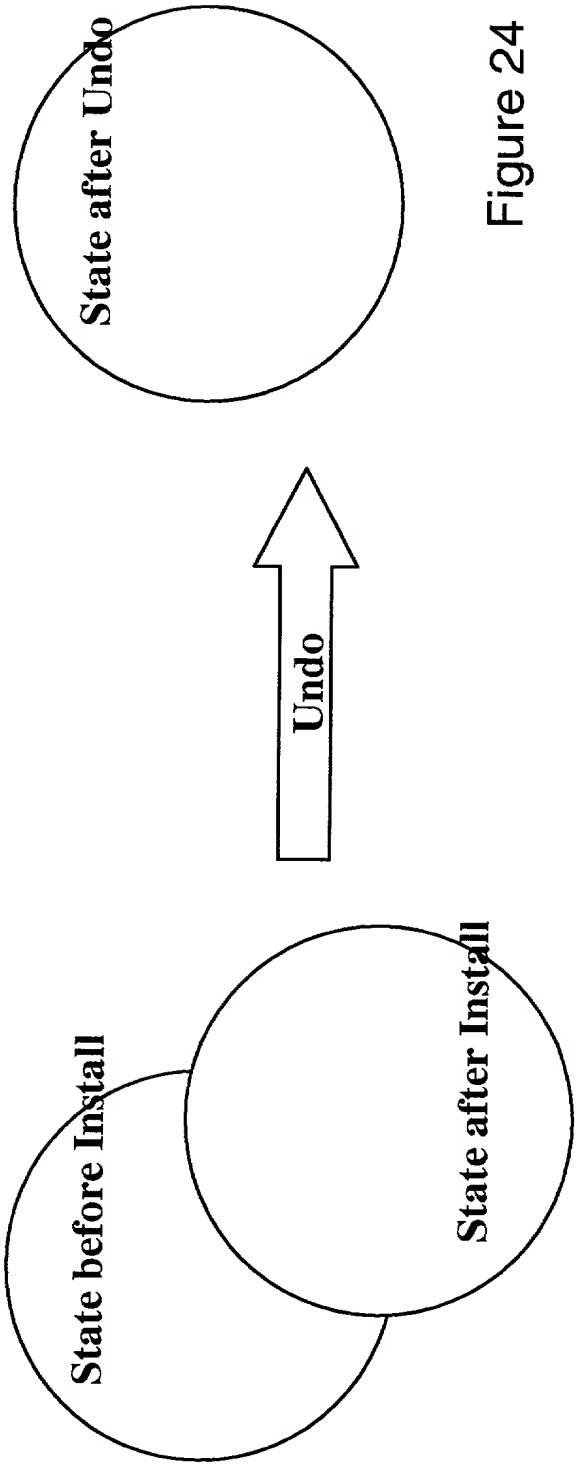


Figure 24

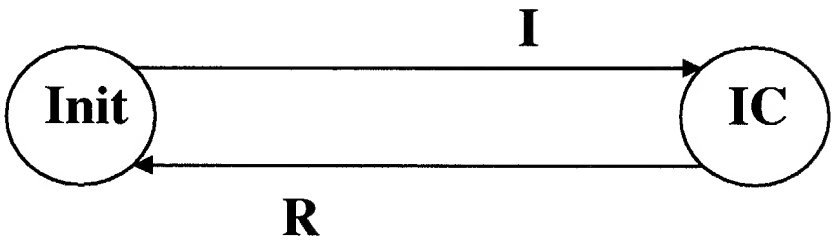


Figure 25A

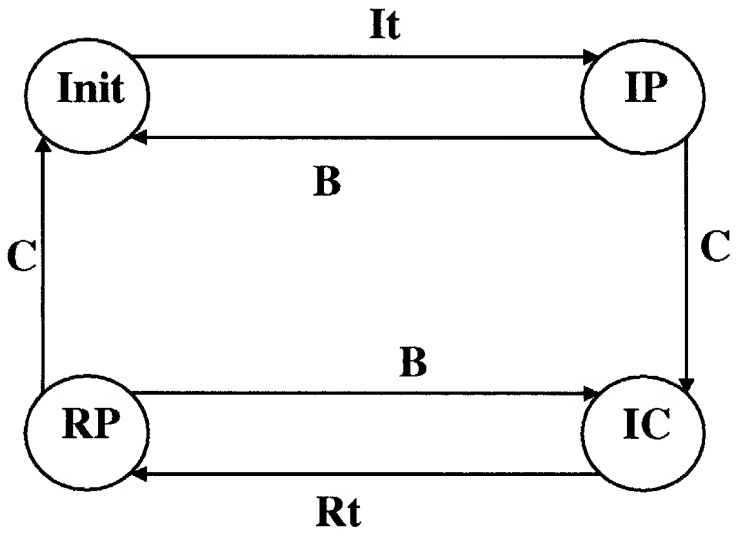


Figure 25B

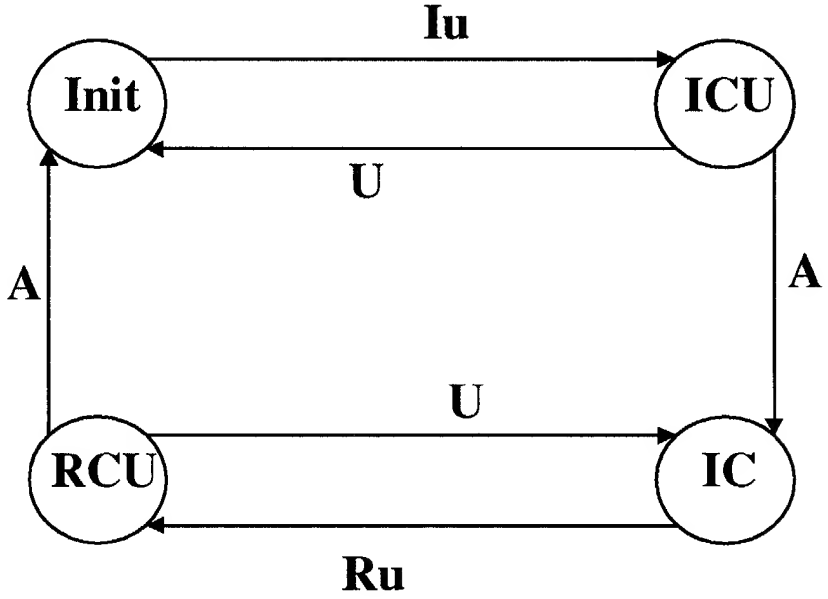


Figure 25C

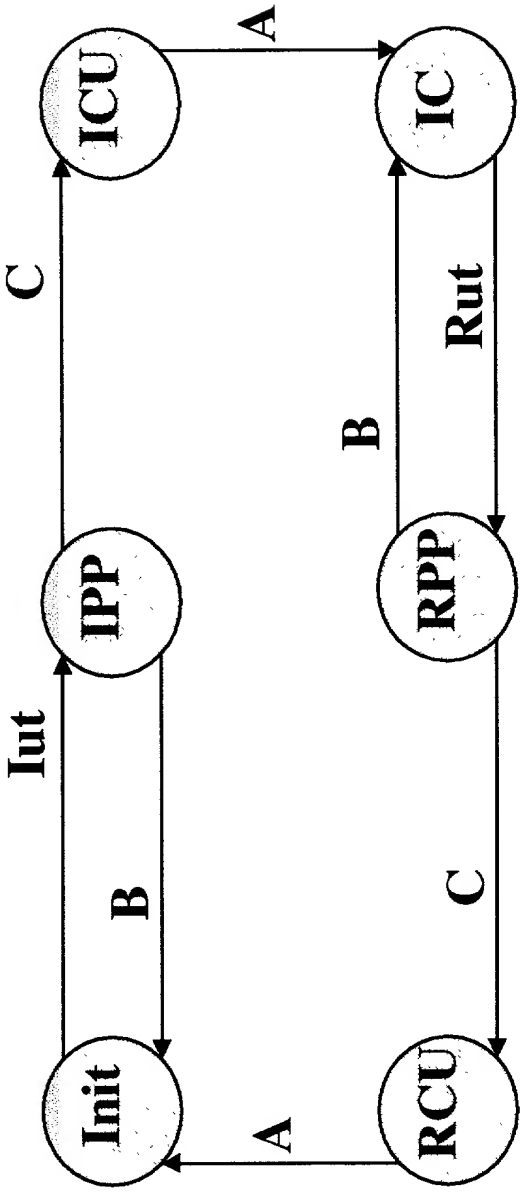


Figure 25D

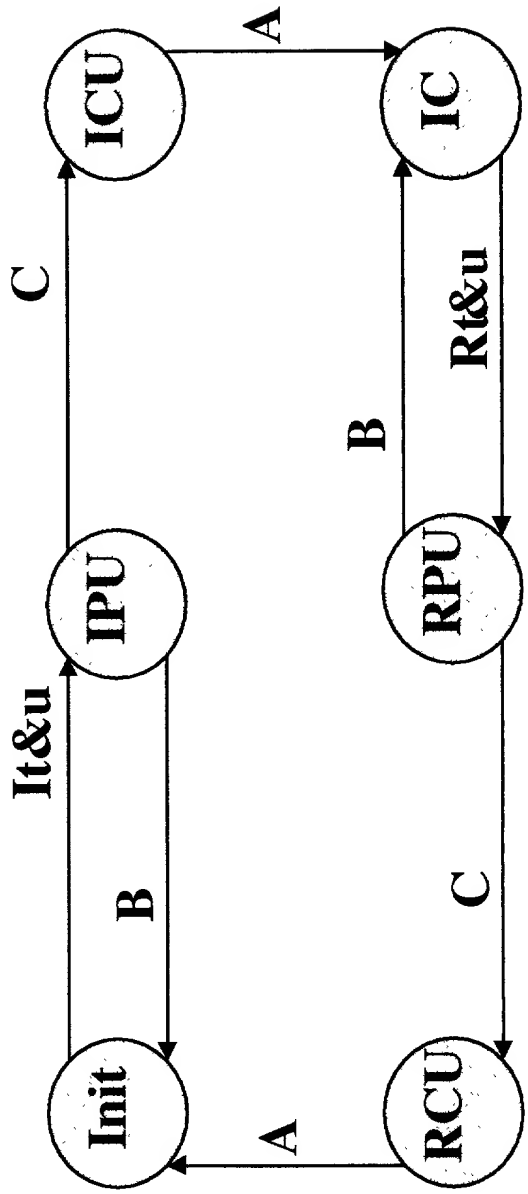


Figure 25E

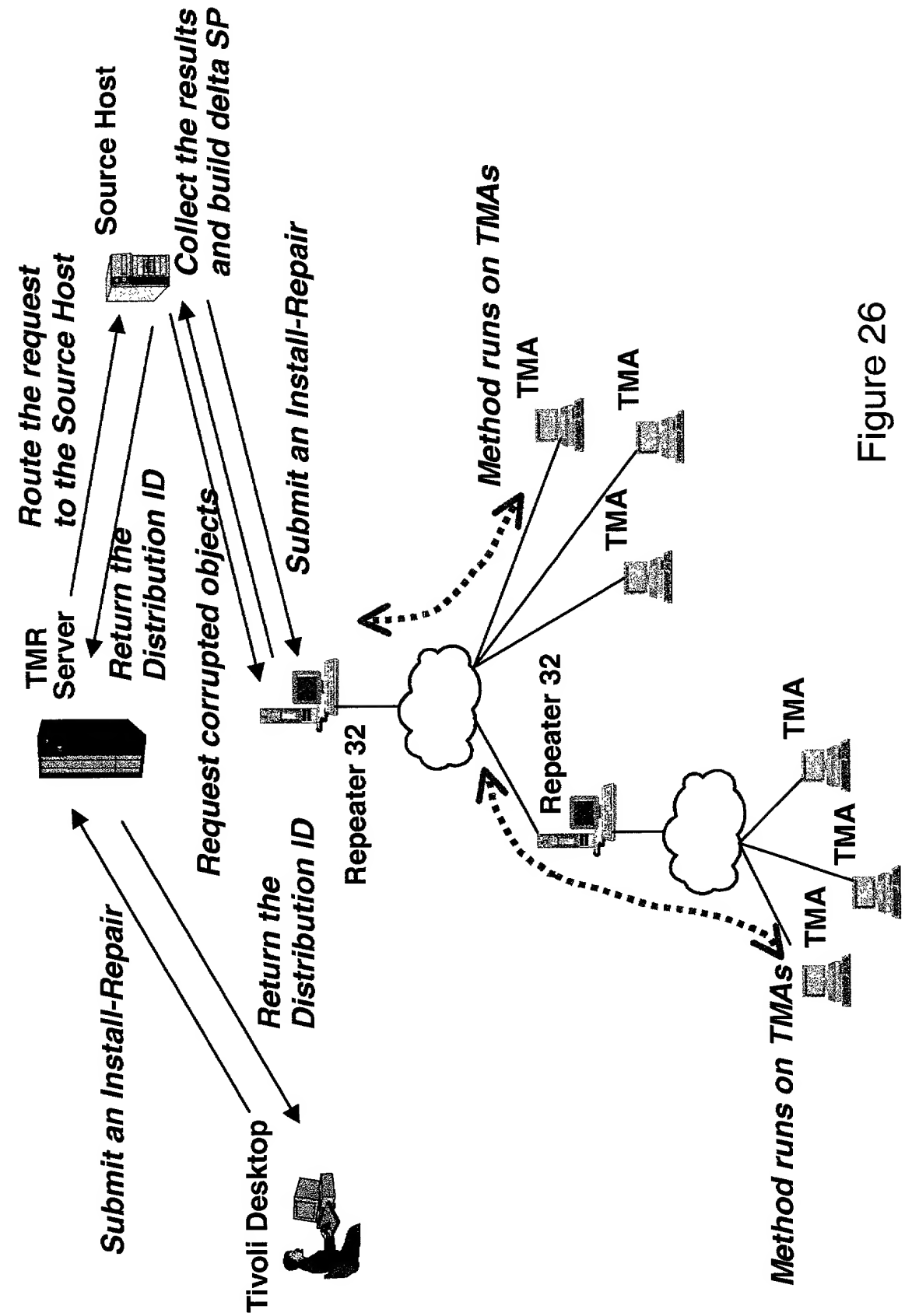

Route the request to the Source Host
Source Host
Collect the results and build delta SP
Return the Distribution ID
Request corrupted objects
Submit an Install-Repair
TMR Server
Method runs on TMAs
TMA
TMA
TMA
Repeater 32
Repeater 32
Submit an Install-Repair
Return the Distribution ID
Tivoli Desktop
TMA
TMA
TMA
Method runs on TMAs

Figure 26

```
...
## Mount the image directory
execute_user_program
  during_install
    name       = $(system_dir)/NET.EXE
    arguments = "USE $(freedrive_01) $(remote_name)"
  end
end
## Run the setup to perform the installation
execute_mssetup_program
  during_install
    name       = $(freedrive_01)/setup.exe
    arguments = "/Q1 /B1"
  end
end
## U-mount the image directory
execute_user_program
  during_install
    name       = $(system_dir)/NET.EXE
    arguments = "$(freedrive_01) /d"
  end
end
...
```

Figure 27